

Public Concerns Regarding the Proposed Crandon Mine & DNR Responses

A Summary of Public Comments and Questions
from the May 28, 1997
Public Meeting at **Wausau**, Wisconsin,
with DNR Responses

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Introduction

The Department of Natural Resources (DNR) wishes to thank all of the citizens who attended the May 28 public meeting at the North Central Technical College in Wausau. As was intended, the Department received many comments and questions during the meeting. Many of these questions raised issues that the DNR intends to analyze before publication of the Draft Environmental Impact Statement (DEIS).

Additional information is available in a number of recently updated mining information sheets available from the Department's Rhinelander (call Cathy Cleland at 715-365-8997) or Madison (call Shannon Fenner at 608-267-2770) offices. These are: *Potential Mining Development in Northern Wisconsin*, *The Cumulative Impacts of Mining Development in Northern Wisconsin*, *How a Mine is Permitted*, *Local Decisions in Mining Projects*, *Protecting Groundwater at Mining Sites*, *Reclamation and Long-term Care Requirements for Mine Sites in Wisconsin*, *How the Department of Natural Resources Regulates Mining*, *Addressing Public Concerns with Wisconsin's Laws Governing Mining*, and *Wisconsin's Net Proceeds Tax on Mining and Distribution of Funds to Municipalities*.

For a comprehensive description of how mining is regulated, refer to: *An Overview of Metallic Mineral Regulation in Wisconsin*, by Thomas J. Evans, published by the Wisconsin Geological and Natural History Survey (WGNHS) as Special Report 13, 1996 (revised edition). The document is available from the WGNHS office in Madison (phone: 608-263-7389).

The following pages contain DNR responses to the questions and comments that arose at the public meeting. In the instances that several individuals asked similar questions, an attempt was made to accurately capture the essential meaning in a single paraphrased question. Of course, with the number of comments received, it is possible that one or more questions have been accidentally overlooked. This is not the Department's intent, and any questions not answered within this document should be sent to Bill Tans at the following address: Bill Tans (SS/6), Department of Natural Resources, P.O. Box 7921, Madison, WI 53707. The questions and comments are written in bold type, and the Department responses follow each question in regular type. Where Wisconsin Statutes or Administrative Codes are paraphrased, the reader is advised to check the original language if more complete information is desired.

The DNR's Role and "Position"

1.

Q: You keep saying that if Crandon Mining Company (CMC) meets all the laws you must give them permits. What if you don't? Can they sue?

A: The decision-making process for all permits necessary for a mine takes place at the "master hearing". The major portion of this hearing is much like a civil trial, where all parties—the Department, the mining company, municipalities and other interested parties—provide testimony under oath, and subject to cross-examination. It is in this setting that all parties make their case as to whether the applications for the permits do or do not meet the requirements of state law. After testimony is completed, legal briefs will be filed supporting each party's position. When the testimony and briefs have been carefully reviewed, a decision is made on each of the permit applications. There is no option to deny permits if the proposed project meets all of the permitting criteria. Any party to the hearing can then appeal the decisions to the Circuit Court, which would review whether the record of the hearing supported the decision. For example, if a decision is made that the mining company failed to meet the requirements to receive a wastewater discharge permit, the mining company can appeal that decision to the circuit court. Conversely, if the decision following the Master Hearing is that the company had met the requirements of law for receiving a wastewater discharge permit, another party could seek review by the Circuit Court and request the court to overturn the decision.

2.

Q: The elimination of the Public Intervenor's office means that we have no role in this process anymore except to sit here and listen to "facts" that we have no way of refuting.

A: The office of the Public Intervenor in the Department of Justice was eliminated by the Legislature with the consent of the Governor during the 1995-1997 budget deliberations. The Legislature and the Governor have decision-making power over the budget. The Department of Natural Resources was not involved in that decision, although during budget deliberations the Department did testify in favor of retaining the Office of the Public Intervenor as it had existed for almost two decades.

The DNR has been given the authority by the Legislature to review mining proposals in the state. Any interested private citizen can play a role in the process by electing like-minded representatives to establish and revise the laws that regulate mining, as well as participating in the public hearing process prescribed by law. Participation in meetings and hearings, both at the local level and at the state level, helps to ensure that all relevant public concerns are addressed during the decision-making process. The elimination of the Public Intervenor's office has not changed the public participation element of the permit review process.

Through public meetings and the environmental impact process we seek and use public comments on the project. Public comments are relied upon to help determine the full range of issues and potential impacts posed by a mining project. However, if the proposed mine is found to meet all environmental protection standards, comply with all applicable laws, receive local zoning approval and minimize impacts to wetlands, the Department must issue a mining permit. The statutes do not allow the Department the option to deny a mining permit

under such circumstances. If it is determined that the mine cannot comply with all our laws and regulations, the Department must deny the permit. Public acceptance of a proposed mine cannot be considered by the Department in reviewing a mining proposal. There is no "popular vote" built into the environmental review of projects, including mining projects.

3.

Q: Is the Secretary of the DNR an elected or appointed position?

A: The Secretary of the DNR is appointed by the Governor.

4.

Q: The DNR Secretary is appointed by the Governor and this has ruined the credibility of the DNR - the decision on this mining project has already been made because the Governor wants mining and the DNR Secretary can't say no to him. Since the Secretary of the DNR is appointed by the Governor, and if the Mining Moratorium bill doesn't pass, it is my opinion that there will be an all out effort and directive to issue all necessary permits to allow this project to proceed - what is your opinion?

A: The fact that the Governor now appoints the DNR Secretary has not changed the criteria in the law and our regulations upon which the mining proposal will be judged. This agency will conduct a thorough and technical, professional analysis of the proposal and judge it based on those criteria. At the master hearing on the project, each DNR staff person will testify under oath as to whether the Governor or any DNR supervisor unduly influenced them to take a position on this project not consistent with their technical assessment. Our Secretary has urged us to conduct a careful review, to conduct all necessary studies, and to err on the side of being conservative. Based on our supervisors' actions and the obvious sensitivity of this proposal, not a single person working on the Crandon Project review and analysis shares your above-stated opinion.

One other point is worth noting: appointment of agency heads by the Chief Executive Officer is the norm, not the exception, in both State and Federal governments. The Governor, as head of the Executive branch of Wisconsin's government, appoints agency heads just as the President, as head of the Federal government, appoints agency heads (like that of the EPA) during his administration.

5.

Q: Jobs are a big idea in the Crandon considerations. What about your jobs? Your boss is an appointed official who answers only to Thompson. What happens to your jobs if your "scientific" studies reveal information not desired by Tommy Thompson? Is your professional credibility now not immediately at high risk?

A: While changing DNR to a Cabinet level agency does give the Governor the power of appointing the DNR secretary, DNR Secretary Meyer has had limited involvement or oversight of the Crandon Project review, and virtually no involvement with day-to-day decisions regarding our review. As a point of information, the DNR Secretary takes significant direction regarding many aspects of DNR activities from the Natural Resources Board (NRB). This Board has significant policy-making authority over the Department.

The perception or concern that DNR staff have little credibility because they would be

willing to hide information about real dangers from the proposed mine in order to "save their jobs," is not based on fact. Employees working on the Crandon Mine Project have been advised that they will likely be questioned at the Master Hearing about how they arrived at their conclusions and that they should answer truthfully - including if they believe they have been directed to act contrary to their professional judgements. Wisconsin has a long history of open government, good civil service protection for its employees, a solid "whistle blowers" law and strong employee unions. Employees of the Department are in no danger of losing their jobs if they arrive at professional judgements contrary to the interests of Crandon Mining Company.

6.

Q: Has an Environmental Impact Statement already been completed? By whom?

A: An Environmental Impact Statement (EIS) has not yet been completed for the Crandon Mine project. It is estimated that a Draft EIS (DEIS) will be released for public review in early 1998. The DEIS will be written by the DNR. Please see Appendix A for a proposed timeline for the DNR's review process.

7.

Q: The panel's choice of words, many times causes one to think that this is a done deal. For example: rather than "would" be "such and such" - gives the impression that the decision has already been made. Are you at least "leaning" in the direction of allowing this project to begin?

A: As we have stated at all public meetings in the spring and early summer of 1997, DNR reviewers need to complete a great deal of review work before anyone can determine whether this project could meet all the environmental protection requirements required by law. It might be late 1999 before permit decisions can be made. Department staff at public meetings try to speak as accurately as possible, but sometimes we inadvertently use a word or tense that can cause a statement to be misinterpreted.

The decision on the mining project is far from pre-determined. Although the DNR Secretary is now appointed by the Governor, there are many important factors that will ensure that the review will continue to proceed in an absolutely fair and unbiased manner. As in all projects, the Secretary has directed that this project be reviewed in a thorough and impartial manner, with no bias for or against the project. The DNR has hired knowledgeable, independent consultants to review the information provided by CMC and its consultants. These consultants have also requested updates, revisions, and improvements in the methods or procedures CMC has used in obtaining technical information about the mine site and in determining the effect of the proposed mine on the regional environment. If, following the review, the Crandon proposal cannot comply with all relevant state, federal, and local laws, the mine cannot be permitted.

State mining law requires that the DNR hold a Master Hearing after release of the EIS. This trial-like hearing enables all interested persons, groups, agencies, tribes and municipalities to question any aspect of mine development, waste storage, permit review, data acquisition, data analysis, and any other related topic and enter information or testimony into the record. The final written decisions on the permits are based on the entire record, not just on the DNR's position. Department staff who worked on this project will be made available at

the Master Hearing. The decisions reached as a result of the Master Hearing can be appealed either administratively (to the DNR Secretary) or judicially (to a court of law).

The Department is fully aware of public concerns regarding political influence in this process. We want everyone in this State to understand that our review has been, and through the end of this process will always be, based solely on the best scientific review possible. There will be no other influences allowed to affect the permit review and development of the EIS.

Legislation & Regulations

8.

Q: What would occur with the permitting process upon passage of the "Mining Moratorium Bill?"

A: SB3 (the "Mining Moratorium Bill") which recently passed in the Senate, is now in the Assembly Environment Committee, chaired by Representative Mark Duff, awaiting action. There probably will be hearings on this issue this fall. In order to become law, it must be passed by majority vote out of the Environment Committee, passed by the Assembly, and signed by the Governor. If it passes these steps without further amendments, the legislation as currently worded would impose specific conditions on sulfide mining in the state. A sulfide mine could not open unless another mine in similar geologic conditions had operated for ten years without breaking any environmental laws, *and* a mine in similar geologic conditions had been closed for ten years without violating any environmental laws. As currently worded in the Senate version, the bill would not likely constitute a moratorium on mining. The Department, as the agency which would interpret the bill, believes that the Crandon Mining Company would likely be able to locate examples of mines which would comply with all the criteria. Please see Appendix B for the opinion of the Wisconsin Legislative Council.

Both houses must agree on the exact language of the bill before it gets sent on to the Governor. Sometimes this involves appointing a committee, made up of representatives from each house, to reach a compromise. Because the bill could be significantly changed during this process, it is currently impossible to predict its effect on the Crandon mining project. Up-to-date information on the bill's status can be found by calling the Legislative Hotline at 1-800-362-9472. Just as with all other legislation, if the bill is passed by both houses, the Governor has the power to veto it. However, a 2/3 majority in both the Senate and the Assembly is required to override a gubernatorial veto.

9.

Q: What regulations determine the content for the fill in closure of the mine? Can toxic waste be used?

A: NR 132 contains criteria for the content of mine backfill. The basic requirement for mine backfill is that it not violate any groundwater laws or regulations. To determine the effect of mine backfill on groundwater, extensive waste characterization work is being done to be used as inputs to a groundwater model. This will enable the Department to determine the potential contaminants and their likely dispersal patterns. Waste that would significantly affect groundwater quality could not be approved as mine backfill.

The Project

10.

Q: Why can any company come in and exploit our minerals without the state having any say in it? Why shouldn't the State of Wisconsin and its people own the valuable metal resources, and thus be allowed to determine when it should be exploited, instead of leaving that decision up to, in this case, a multi-national private company? Won't the value of the heavy metals increase as other supplies are depleted? It seems it would be prudent to sit on this resources until it is truly needed and more safely exploited.

A: Minerals are not "our" minerals unless the State has retained or purchased the rights to the minerals. Minerals are legally considered to be "real property" just like any piece of real estate. In some cases, mineral rights were retained by the federal government or by states when the property was initially made available to the public well over one hundred years ago. In many cases, the mineral rights are transferred along with surface rights as part of the total bundle of property rights when land is bought and sold. The Crandon Mining Company owns or controls the mineral rights to the Crandon ore body.

While the state cannot control when a mineral rights holder might choose to remove minerals from an ore body, the state can and does place significant restrictions on *how* those minerals are extracted, in order to prevent or reduce the risk of substantial harm to public resources (such as air and water) and rights. Just as a home owner in a neighborhood with fluctuating property values has exclusive control over when to put a home on the market, a holder of mineral rights is able to make that same kind of decision regarding minerals.

11.

Q: What is the worst case scenario for environmental damage?

A: The State's mining and mining waste rules each require an applicant to identify various scenarios of failure and the remedial measures that would be taken if such events occurred. The risk assessment and the contingency plan evaluate short-term events, such as spills or pipeline breaks as well as long-term problems, such as leakage from a waste facility. In addition, the applicant must also consider natural events, such as heavy precipitation, tornadoes or forest fires, and have corresponding plans to deal with those situations as well. The plans and approvals will clearly delineate when certain actions must be taken, so that related impacts are minimized. These plans must be reviewed and approved as part of the regulatory process, and, if a project is approved, the risk assessment and contingency plan are made part of the permit or approval. As such, they essentially have the force of law.

In conducting its review of a mining project, the Department will analyze various scenarios of failure or leakage from a waste facility. The degree of failure analyzed will be bounded to some extent by what the Department feels is reasonably possible to occur. Under the proposed mining rule revisions, the Department will also determine the costs associated with implementing remedial measures should such a failure occur, and require posting of adequate funds to cover those costs.

As with any human activity, there is always a risk of harm or injury, but the Department's review is addressing ways to keep risks to a minimum. One of the risks most difficult to control is that involving the highway or rail transport of hazardous substances used in ore processing. A chemical spill has the potential to devastate aquatic life along many miles of streams under worst-case circumstances (a large volume of a highly toxic substance spilling into a small stream when the ground is frozen). Even though the risk of this kind of disaster is very small, CMC would have to develop a spill prevention, response and recovery plan acceptable to the Department.

If the Department identifies a risk of destruction of, or even a substantial harm to, the region's surface water quality, air quality, or other resources, the mining project would not be permitted.

12.

Q: How does all this compare to the Idaho Mining Project which was turned down in past years?

A: We contacted state mining regulators in Idaho, who told us that there have been no denials of mining permits there in recent years. Perhaps the questioner was thinking of the proposed Crown Butte New World Mine in Montana, 2.5 miles from Yellowstone National Park. There are a number of similarities and a number of differences between that proposal and the proposed Crandon Mine. The proposals are similar in that:

- Concerns exist regarding potential impacts to regionally-cherished and nationally renowned rivers - the Wolf in Wisconsin, and the Lamar and Clark Fork of the Yellowstone in Montana.
- Both areas where these mines are proposed have local economies based on tourism.
- Conditions exist at both sites that pose the risk of acid rock drainage.

The proposals differ in that:

- The area of the tailings disposal site and volume of tailings at Crandon would be about 5 times that of New World.
- Only two small Montana towns would bear the brunt of worker influx, whereas the region around the Crandon site offers many more opportunities to spread these impacts out.
- Part of the New World site is on federal land (Gallatin National Forest), while no federal land is involved at the Crandon site
- The New World applicant, Noranda Minerals, violated state (Montana) water quality regulation in the past 10 years, whereas CMC has not violated applicable Wisconsin state environmental law.
- The New World region is less seismically stable than northeastern Wisconsin.
- The New World site is habitat used by an endangered species (grizzly bear) that cannot be readily relocated and that is not likely to make significant population improvements in the foreseeable future to become a candidate for an upgrade to threatened status. The Crandon site contains habitat for an endangered species (goblin fern) that, based upon recent population surveys is a likely

candidate for an upgrade in status to threatened, special concern, or possibly even removal from the state endangered species list.

- While both sites are slightly north of 45° north latitude, the New World site is 8,000 feet higher in elevation, and is subject to a longer, colder winter conditions, and a much shorter growing season, making site re-vegetation more difficult.
- The approximate *gross* value of the Crandon ore body has been estimated to be ten times the gross value of New World. This may mean that CMC might be more persistent in seeing the permit review process through to a final decision.

The Crown Butte Mine was not "turned down" in the sense that permits were denied by the state or federal governments. Instead, the U.S. Department of the Interior has proposed that the federal government pay \$65 million in general taxpayer-derived revenues to buy the mineral rights from Crown Butte. As of mid-June, that proposal has met with significant opposition as the U.S. Congress deliberates on the next Federal budget proposal.

13.

Q: Would the Crandon Mine consent to independent testing by the EPA, Environmental Decade, etc.?

A: This questions would be better asked of the Crandon Mining Company. The Department cannot speculate about whether CMC would consent to independent testing. CMC would be required to submit to testing by any agency that has regulatory authority over the project - such as the DNR and the Army Corps of Engineers. CMC would not be required to submit to testing by other interested parties, such as Environmental Decade.

14.

Q: As scientists, engineers, and managers, we sometimes find these technical challenges intriguing. Plus, it is very easy to become swayed by the technical merits of the project, because the Department must work closely with CMC. Does this affect the project review?

A: No. Because we regulate many private, industrial and municipal activities, Department staff function as professionals. Our technical meetings are open to the public for observation, and interested members of the public are welcome to observe how we interact with the applicant. In addition, we work as a team, with usually more than one individual knowledgeable about any particular subject area, and assist each other in conducting a credible review.

15.

Q: What is the status of the permitting process that is going on with other major agencies such as the Army Corps of Engineers?

A: The U.S. Army Corps of Engineers has developed its estimated schedule for completing its environmental impact statement and permit decision by the end of 1998. While the Department's EIS will likely be completed before that of the Corps, our decision on the project will probably be about one year later due to our lengthy master hearing process.

16.

Q: Why aren't best available technology standards being required in this project?

A: The goal of any permit applicant is to select technologies which will safely and consistently meet the standards prescribed by law. If a technology will meet the standards, the Department has no authority to require the use of a different technology.

17.

Q: All this technology is unproven - are you saying that its okay for CMC to experiment on us? Your best "projections" are merely guesses and experiments.

A: It is not true that this technology is unproven. The proposed wastewater treatment system, for instance, would consist of proven technology for the removal of metal contaminants, which are the primary pollutants of concern at a mine. The primary wastewater source is the mine drainage water that consists of the groundwater seepage into the mine that becomes contaminated by the ore and mining activities. Treatment processes for the removal of dissolved metals consist of lime precipitation, sedimentation of the metal hydroxides in a clarifier, sulfide precipitation for additional metals removal, filtration through sand filters to remove suspended solids, and pH adjustment. This same type of treatment is currently used at the Flambeau mine near Ladysmith, which is generating effluent quality in compliance with its wastewater discharge permit. See Response #11 for a discussion of the technology proposed for the Tailings Management Area (TMA) liner and cap.

Our decisions will not be based on guessing. To "guess" means to make a judgement *without sufficient information*. The Department's review of this proposed mine will be based on a careful consideration of all the pertinent information that we can identify as being necessary to making a sound judgement regarding the potential impacts of the project. We will use scientific and engineering principles upon which to base our decisions. In instances where there is some uncertainty about our impact predictions, we will use worst case conditions to determine if environmental standards will be met.

Testing and modeling during the review process are performed precisely because of the desire to avoid 'experimenting' in actual projects. Experimentation, however, *is* a cornerstone of sound science. Tests that mimic conditions concerning durability, pollution prevention, wastewater treatment, and other issues, are considered during the evaluation of this mining proposal.

The Tailings Management Area (TMA)

18.

Q: Why did CMC select a site that is higher than area water bodies - then the tailings can drain into them.

A: Many factors determine the best location for tailings disposal. The TMA area is not particularly environmentally sensitive, compared to most of the other potential disposal site locations that have enough area, access, and soil resources to be useable. In terms of depth

to groundwater, soil types, and ability to support weight, upland locations such as the TMA are clearly superior to the lowland areas. The geology and topography do not change substantially for many miles around the mine site area, so when considering a number of alternative sites, there are many good reasons to pick the one closest to the mine. The proposed TMA location appears to be as good as or better than the other candidate sites. Locating a disposal site in lowland would not be approved because of the requirement to minimize wetland impacts, and lake beds cannot be destroyed by a mining project because they are held in trust for the citizens of Wisconsin.

The Department can reject a proposed site for cause, but under the law, the site selection process is the responsibility of the applicant. Specific site selection criteria spelled out in the law and regulations must be followed by the applicant during the selection process. The following is a brief summary of some of the more important siting criteria:

- the physical characteristics, geology, and hydrogeology of the site must support a design that would not result in a violation of surface water or groundwater quality criteria;
- the site must provide for a structurally stable design;
- the site must not be within 1000 feet of a navigable lake, pond or flowage;
- the site must not be within 300 feet of a navigable river or stream;
- the site must not be within a floodplain;
- the site must not be within 1000 feet of a state trunk highway unless screened;
- the site must not be within 1200 feet of a private or public water supply well;
- the site must not be located over a known mineral resource;
- the site must be large enough so that the exterior of the facility berm would not be within 200 feet of any property line;
- site selection criteria must include the minimization of disturbance to wetlands;
- site topography must allow for provisions for the diversion and management of storm water runoff around the facility;
- if practicable, the site should be located in the same watershed as the mine surface facilities.
- tailings pipelines should be as short as practicable;
- the site must not be within areas having the presence of endangered or threatened species unless these species can be firmly re-established elsewhere;
- archeological areas must be identified and protected; and
- the parcel must allow for a facility design which would meet all other local, state and federal rules and regulations, including local zoning requirements.

In addition to the above, there are some practical siting criteria that the company must consider, including the following:

- the land must be available from a willing seller;
- suitable access routes to the site must be available;
- the parcel must be large enough to contain most if not all of the waste, plus provide for up to 1200 feet of buffer area around the facility;
- splitting the waste facility into two separate sites could be considered, but three or more locations would probably be unacceptable because of the extensive

- network of pipelines and haul roads that would be required; and if possible, the site should contain enough suitable soil so that soil from off-site is not required for construction and reclamation.

The initial TMA siting process conducted by Exxon Coal & Minerals resulted in the selection of 35 sites, within approximately 12 miles of the mine site, which alone or in combination would be of suitable size. Approximately half of the selected sites were located in lowland areas and the Department advised the company that these were unsuitable due to wetland, groundwater and surface water considerations. The remaining sites were evaluated and ranked based on the above criteria, resulting in the final selection of the proposed TMA location. None of the other sites were found to have significantly superior soil, geologic, or hydrogeologic characteristics that would have resulted in additional protection of the groundwater or surface water. Documentation covering the investigation and site selection process is contained in several reports and is available for public review at the Department's regional headquarters in Rhinelander upon request.

If, as implied in the question, the TMA at its proposed location would leak metals into nearby waters in a concentration that would violate state water quality standards in groundwater or surface water, the mine could not be permitted. The DNR's ongoing groundwater modeling review will assist us in resolving that issue.

19.

Q: Do you agree with CMC's proposed tailings facility design? Has the proposed liner design been used anywhere previously?

A: It is inappropriate for the Department to declare that it agrees or disagrees with the design, before we have issued the EIS and held hearings. What we can say is that the TMA design includes all of the elements that lined-containment disposal sites are supposed to include, and it incorporates all of the major engineering and design changes discussed with Department staff aimed at minimizing groundwater impacts. The use of geosynthetic materials such as GCLs, geomembranes, and geotextiles is very common in landfills for all sorts of solid wastes. The use of GCLs in conjunction with geomembranes for liners and covers of landfills has increased considerably in the past several years.

There are really no good alternatives to using a lined-containment landfill type structure in an upland location for the TMA. A disposal site is best managed when it is located close to the point of waste generation, so that difficulties of transport of waste and water are minimized and the mill manager can patrol and manage the site more frequently. To protect groundwater quality, a tailings disposal facility in Wisconsin must be designed with a multiple liner system and a leachate collection system. This limits effects by both process water used to transport the tailings and any leachate produced by sulfide oxidation of the tailings mass. Given the time and materials necessary for construction of lined disposal sites, it is logical to make the TMA area as small as possible and the tailings depth as thick as possible.

These design elements apply to any waste disposal site, and the Department generally is in agreement with them. In our early meetings with CMC on the design of the TMA, most discussion focused on the liner and capping layers.

The original design of the TMA included one foot of compacted natural clay covered by a 60 mil HDPE geomembrane for both the liner and capping layer. We did not agree with that design, due mainly to the relatively thin dimension of one foot for the natural clay component.

We anticipated that use of natural clay would lead to considerable potential for construction problems because of the long period of time necessary to place clay over the areas taken up by the TMA cells. We were also concerned about the potentially large environmental impacts of excavating and hauling the huge amounts of natural clay necessary to line and cap the TMA.

In discussions with CMC on the conceptual engineering of the TMA, the Department recommended that either the clay layer thickness be increased in both the liner and final cover or that an alternative design be pursued. For the latter alternative, we recommended that they combine the best properties of the till soils with manufactured geosynthetic clay liners (GCLs). A GCL is a layer of swelling clay held in place between layers of strong plastic fabric. If CMC chose to pursue thicker dimensions of natural clay, we anticipated even greater onsite construction problems and offsite environmental impacts than with the original proposed design. If CMC chose to use till and GCL to replace natural clay, construction would be expedited, offsite impacts would be limited, and more reliance would be placed on manufacturing controls. We did not emphasize the use of the admixed bentonite-soil liner proposed in the earlier Exxon project, since GCLs have largely displaced use of such admixed liner designs.

Like many other industrial technologies in current use, the proposed TMA individual liner components have been tested for durability using accepted simulation methods. In addition, the individual components have each been used successfully in other waste disposal systems, although the overall combination of components in the TMA design is one that has not been used before. The processed till layer and the bentonite in the GCL are natural materials that have already existed for thousands of years, so their properties would not be expected to change significantly in this application. The polyethylene geomembrane and polypropylene or polyester geotextiles have expected survival lives of several centuries or more under buried conditions.

Bentonite clay, the primary component of the proposed GCL, has a very low natural permeability and has been used for containment facilities for decades. For instance, bentonite blended with natural soils has been used in Wisconsin and other states for sewage and water retention lagoons. The use of bentonite clay in the form of GCLs is a more recent development, propelled largely by manufacturing innovations and recent changes to federal law dealing with municipal solid waste landfills. Regulatory acceptance of GCLs has similarly become widespread, due to the results of research on their properties when used as liners.

20.

Q: How long will the TMA liner last? All liners leak. What proof do you have that this one will not? You seemingly dismissed the liner as not relevant, citing "the bottom line is the groundwater." How long will it be necessary to contain the tailings to prevent acidic leakage?

A: There is no question that the liner in the tailings facility would degrade over time. There is some evidence available that indicates that the degradation period is likely to be several hundreds of years. However, once the tailings facility is closed and the original ponded water is drained, the facility cover (not the liner) would be the key to ensuring that an acid drainage problem does not develop. If there is little water percolating into the facility, there would be little water coming out of the bottom of the facility. The cover would limit access of both water and oxygen to the tailings. Without both, acid drainage cannot develop. Since the cover is near the surface and relatively accessible, it could be repaired or replaced

as necessary.

The tailings from the proposed Crandon mine would be potentially reactive indefinitely. That means that should the necessary "ingredients" for acid drainage - oxygen and water - come in contact with the sulfide minerals in the tailings in substantial quantities at any point in time, acid drainage could develop.

21.

Q: Will acid neutralizers be installed to prevent the formation of the acid film that develops on the surface of the water in the TMA?

A: The water that would be present in each tailings cell during operation would consist largely of mill process water. This water will not be acidic, but alkaline, with a pH of about 10-11. That should ensure that the each TMA cell would not be able to form any kind of "acid film" during operation. Once each cell is filled, then the closure and reclamation process for that cell would begin. The first step in that process would be a drainage period to allow the tailings to settle and compact. During that period, the water that may be present on the surface of the tailings may become less alkaline. However, the mining company has proposed to add additional neutralization capacity to the upper layers of tailings in the form of ground limestone. That should ensure that acid conditions do not develop. Following that period, the cell would be capped with the final cover system and removed from the direct access of water and oxygen.

22.

Q: A lot of emphasis is on the discharge into the river - the long term "time bomb" is the leakage from the tailings into the aquifer. What kind of monitoring will be done on this?

A: The Department is currently reviewing the environmental monitoring program for the proposed project. Though our review cannot be completed until the groundwater modeling work is finished, we will ensure that the proposed tailings facility would have a substantial monitoring program. That program would include air monitoring from particulates and other compounds, groundwater monitoring at numerous wells, surface water monitoring of both runoff and stream flow/lake levels, monitoring of the leachate collected in the leachate collection system, and monitoring of the pore water and gases contained in the interior of the facility.

The leachate and facility interior monitoring would be the first line of detection of substantial groundwater contamination by acid drainage. The groundwater monitoring would likely consist of wells completed directly adjacent to or beneath the facility and at key locations around the facility extending out to potential areas of concern. The groundwater monitoring would be set up to ensure that if significant contamination were to occur, the Department would learn of it as early as possible.

23.

Q: Have any studies been conducted to determine ways to recycle or use discharged materials (for example: sulfuric acid production)?

A: The Wisconsin Administrative Code, Section NR 182.11(2)(f) specifies that

mining wastes that are not used for reclamation and that present a significant risk of environmental pollution should be marketed, if the following two conditions are met: 1) The products and by-products of marketing do not present a greater potential for environmental pollution, and 2) Marketing the waste would be less expensive than disposal of the wastes. CMC has not proposed to reprocess the sulfide tailings. A study analyzing the further processing of mining wastes was conducted from 1979 to 1981 by Davy-McKee, a consultant to Exxon Coal & Minerals. In 1984, the Department hired a consultant, Dr. Trevino, to review the Davy-McKee study. Following changes to CMC's original proposal, Coefield and Associates completed a study in 1986 to reexamine the project and the pyrite market. In 1995, a pyrite marketing update was completed by Market Access International as part of the Feasibility Study/Plan of Operation for the Tailings Management Area Report by Foth & Van Dyke. Following that, Dr. Trevino again reviewed the information in a report to the DNR in 1996. Clearly, the processing technology for sulfide tailings, as well as the technical problems and environmental effects, are well documented.

There are many processing techniques which yield usable products from mine tailings. Potential products from tailings include precious metals such as gold and silver, non-ferrous metals such as zinc, copper, and lead, and products derived from pyrite including sulfur, sulfuric acid, iron pellets, gypsum, phosphoric acid, diammonium phosphate (DAP) fertilizer, and monoammonium phosphate (MAP). The products derived from pyrite are of particular interest, because simply removing additional metals from the tailings will not change the scale or concerns (acid drainage) associated with the disposal of waste from the mine.

The primary step in processing pyrite is to separate the iron portion from the sulfur portion. This is done by 'burning' or roasting the pyrite, yielding sulfur dioxide or sulfuric acid and cinder. By using a variety of industrial processes, the sulfur products may be further processed into elemental sulfur, phosphoric acid, DAP, or MAP. The cinder may be processed into iron pellets and nonferrous metals.

These processing techniques and their products, however, present their own challenges, both economically and environmentally. Firstly, sometimes there is no market for many of the pyrite products. This presents problems in that, without a market, the solid wastes would still need to be disposed of properly. The added variability of the scale of the storage facility brings a new element of risk without any guarantee of environmental gain. Planning for such uncertainty may result in assuming a worst case scenario of disposal, resulting in a disposal facility at the originally proposed size. Furthermore, there would be greater uncertainty as to the composition of the waste going into this facility; it would be an undetermined combination of tailings waste and products for which there was no market, including gypsum, cinder, iron pellets, as well as others. Also, as shown in the 1996 Trevino report, all of the processing alternatives currently result in very large economic losses, from nine to seventeen million dollars per year.

As for environmental considerations, processing of the pyrite portion of the tailings diversifies the potential pollution to vapor, liquid, and solid forms. The very act of processing uses vast quantities of energy, which has its own environmental consequences. Each level of processing yields potentially harmful emissions, which may include dust, acid mist, sulfur and metal oxides, as well as others. Solid waste products are cinders, which would still need impoundment at nearly the same capacity, or gypsum, which will need impoundment at potentially a significantly larger capacity. Finally, processing the cinders to a potentially useable product would also yield large quantities of contaminated water. The conclusion of both Trevino reports was that the environmental considerations created by the pyrite

processing were far more complex than the original considerations presented by tailings impoundment. Processing, therefore, is not necessarily an environmentally preferable option to placing unprocessed tailings in the TMA. A final decision on the marketability of the waste products will be made following the Master Hearing.

Liability

24.

Q: Is a bond/trust required before construction or before the permits are granted?

A: Upon the granting of permits, the mining company would be required to submit a reclamation bond and certificate of insurance. Following this submittal, the Department would give written authorization to begin construction. Mining could not start without this authorization.

The Interbasin Transfer of Water

25.

Q: I'm concerned about taking water from one watershed and putting it into another - what effects will that have? Isn't pumping discharge water to the Wisconsin River from the Wolf River like robbing Peter to pay Paul?

A: State law does not allow the DNR to specify where a company must discharge their wastewater. Rather, the law requires the DNR to ensure that any discharges meet the surface water quality standards for the specific body of water proposed to receive the discharge.

State law specifically provides for interbasin transfers of water out of the Great Lakes basin. The greater the amount to be withdrawn, the greater the permitting requirements and difficulty of receiving approval. The law does not require replacement of the water withdrawn from the Great Lakes basin because at the removal level proposed by CMC, there would be no measurable impact on the Great Lakes.

State statutes require an evaluation of all out-of-basin diversions. There isn't a total allowable capacity specified. There is, however, an allowable capacity for each individual diversion, so evaluations would be case-by-case. The water losses from each applicant could be limited individually to protect public water rights, including lake levels and stream flows.

Conditions such as drought and long-term cumulative effects would be taken into consideration in an approval process for both surface water and groundwater interbasin diversions. However, the average water loss (including the discharge to the Wisconsin River, evaporation, and water being shipped out with the ore concentrates), is currently expected to be less than the 2,000,000 gallon per day threshold that requires our approval. Therefore, the mine's water loss wouldn't be considered threatening to the waters of the state, in accordance with Ch. NR 142, Wis. Adm. Code, "Wisconsin Water Management and Conservation." During drought conditions, mine drainage water would likely be less, reducing the water loss. Because the water loss would be greater than 100,000 gallons per day, there would be a

reporting requirement imposed to monitor the volume of water loss to see if it approaches the 2,000,000 gallon per day level of regulation.

26.

Q: Does the Water Resources Development Act of 1986 apply to the diversion of waters to the Wisconsin River? If not, why? Are there examples to use as models for transferring water from one watershed to another? What about federal laws on this?

A: There are both federal and state laws which address diverting water from one watershed to another. The Water Resources Development Act of 1986 is the federal law which deals with such diversions. The Department has reviewed that law and believes that it does not address water which is pumped from the ground and discharged to a surface water in another watershed. Since the adoption of the law in 1986, there have been a few instances in other Great Lakes states in which such ground to surface water diversions have occurred and been accepted by the Great Lakes states as being acceptable under the Water Resources Development Act.

Wisconsin law is more precise on this issue than Federal law. Wisconsin law applies to diversions of groundwater in the same manner as diversions of surface water. However, under Wisconsin law, no permit is required unless the diversion exceeds 2 million gallons per day, and other Great Lakes states are consulted only if the diversion from the Great Lakes watershed exceeds 5 million gallons per day. This law has been in existence since the early 1980s and applies to all types of projects. Since the proposed Crandon Mine diversion would be well under 2 million gallons per day, it is only required to notify the Department. The Department has not been authorized by the Legislature to prohibit such a diversion. Several municipalities, including Portage and Kenosha/Pleasant Prairie, discharge wastewater to different watersheds than they obtain their water.

27.

Q: In moving water from one watershed to another, how much will the water level drop in Little Sand Lake, Deep Hole Lake, Rolling Stone Lake, Oak Lake, Duck Lake, etc.

A: First, it is important to understand that transferring water from one watershed to another does not in itself cause lake levels to change. Lake level change is the result of the interaction of a number of factors. The Department's review of the groundwater flow modeling has not yet been completed, so the Department has not made any recent forecasts regarding impacts to local lakes and streams. Additional information regarding the lake bed sediments and local hydrogeology has been gathered since 1986 and this information will be used along with more advanced modeling techniques to develop a new forecast.

In the ongoing permitting process, the mining company has made new predictions regarding lake level drops if there were no mitigation. These predictions are contained in the following table, and, as mentioned, have not yet been verified by the Department. In considering the significance of these lake level drops, it is important to remember that the mining company would have to supply water in sufficient quantity and of comparable quality in order to prevent any harm to public rights in these surface waters.

Table 1. CMC predicted lake level drawdowns

Lake	Best Engineering Judgement (BEJ)	Practical Worst Case (PWC)
Little Sand Lake	0.07 feet (0.8 inches)	0.48 feet (5.8 inches)
Duck Lake	0.01 feet (.012 inches)	0.11 feet (1.32 inches)
Deep Hole Lake	0.02 feet (0.24 inches)	0.39 feet (4.7 inches)
Skunk Lake	0.53 feet (6.4 inches)	0.58 feet (7 inches)
Rolling Stone Lake	no impact	no impact

Wisconsin River Water Quality

28.

Q: What exactly will be piped into the Wisconsin River? Is it organic or inorganic waste and how will it affect the dissolved oxygen content of the river?

A: The effluent quality, indicated in the attached Appendix C, is from a pilot treatability study done on simulated wastewater using treatment processes proposed for the wastewater treatment system. Actual effluent quality may vary, but based on the pilot study, effluent would be in compliance with the proposed permit limits. The wastewater treatment system effluent piped to the Wisconsin River would be primarily treated groundwater that drains into the mine. As groundwater seeps into the underground mine, it picks up small amounts of inorganics consisting of metals and sulfate from the ore body. Other sources of pollutants entering the wastewater would be drainage from mine backfill and water to control dust. Very little organic material would be in the wastewater. Wastes with BOD₅ (Biochemical Oxygen Demand) could consist of residuals from the ammonia nitrate explosives, and oil & grease from mining activities. Based on the maximum effluent flow and the estimated BOD₅ concentration, dissolved oxygen modeling indicates an impact to the dissolved oxygen content of the river downstream of the Hat Rapids Dam would be unmeasurable, especially since the river is free flowing here and re-aeration is occurring. However, we have alerted CMC that we could not allow detectable amounts of BOD₅ demand to be discharged into the Wisconsin River because it already has too much. This increased BOD₅ demand in the river consumes dissolved oxygen, occasionally causing dissolved oxygen in the river to fall below the 5 ppm standard needed for healthy fish populations.

29.

Q: What happened to the "fishable/swimmable" goal for the Wisconsin River? Why should more pollutants be allowed to enter the Wisconsin River and not an effort to have less allowed by industries and governments already polluting? I'd like to see the Wisconsin River really clean. If the water being discharged has been determined not to be suitable to be put into the Wolf River, what suddenly makes it okay for the Wisconsin River?

A: The "fishable/swimmable" goal is still very much in affect. This goal is implemented through national discharge standards and Wisconsin water quality standards. The Wisconsin River is designated as a Fish & Aquatic Life Water. This designation means that no discharges are allowed which would significantly affect even the most sensitive organisms in the river or would affect recreational opportunities on the river. Even higher water quality standards apply to the Wolf River because it has been designated as an Outstanding Resource Water.

Any new or increased discharge into waters of the State cannot be outright prohibited by the Department, provided that the discharge meets water quality standards. Likewise, State laws do not allow the Department to dictate where a company will discharge its wastewater. The users of waters of the State, including municipalities and industry, are entitled to due process under the laws and administrative codes regulating wastewater discharges. These regulations are designed to prevent any significant lowering of water quality and to protect the use classification of the water. If a proposed discharge can meet the water quality limitations, it must be permitted. And if it doesn't, the discharge would be prohibited.

30.

Q: How does the DNR know its surface water quality model will work?

A: Wasteload allocation (WLA) models for BOD allocations have been used successfully on 3 segments of the Fox River, 3 segments of the Wisconsin River and the Oconto, Flambeau, Peshtigo and Menominee Rivers. Each of these applications is similar to Segment A of the Wisconsin River in that large sources of BOD from pulp and paper mills combine with municipal sewage to cause dissolved oxygen impacts in the receiving stream. All of these applications included extensive data gathering to define the river conditions and rates of decay of BOD and other oxygen impacts. This allowed the models to be calibrated and verified to real data before WLAs were created. Finally, the resulting allocations have led to attainment of dissolved oxygen standards over many years at some site, as verified by data.

31.

Q: You mentioned that the surface water quality laws would protect the most sensitive aquatic life. What does that actually mean? What species? Which are expendable?

A: Surface water quality criteria are numeric standards established by conducting biomonitoring toxicity tests using at least eight species such as trout, bluegill, fathead minnow, water flea, dragonfly, and crayfish. Specific species associated with a particular water may be added on a case-by-case basis to protect them. These toxicity tests determine at what in-stream concentration a toxic substance, zinc and copper for example, would kill or cause adverse effects on growth and reproduction of fish and aquatic life. Based on these scientific studies, the criteria that is then used as the water quality standard for calculating a permit limit is based on protecting the most sensitive species. The most sensitive species may vary according to what the toxic substance. By protecting the most sensitive species from toxic substances, this procedure is intended to protect all species. No species are expendable.

32.

Q: How many miles of river is needed to get 5 ppm dissolved oxygen?

A: This question refers to the length of river necessary to achieve acceptable dissolved oxygen levels (greater than 5 ppm) after the addition of BOD. There is no standard value for how many river miles are needed to achieve 5 ppm dissolved oxygen. Oxygen levels in streams are depleted primarily by the decay of organic and inorganic materials. Municipal treatment plants, agricultural runoff, industrial activities, urban run-off, and even drainage from wetlands all contain certain amounts of these organic and inorganic materials. These materials are referred to as BOD, or bio-chemical oxygen demand. As water travels down stream, levels of dissolved oxygen are then restored in two ways - through the entrapment of gases in riffle areas and through photosynthesis by aquatic plants. Because these processes vary depending on location, vegetation, season, temperature, and other factors, the river miles needed to replenish the oxygen can also vary.

The goal of the Wasteload Allocation (WLA) process is to maintain at least 5 ppm at any point of the Wisconsin River, including at the point of discharge or any point in the river down stream. See also Response #39.

33.

Q: Do you think the river at this time can handle the existing load? Are current water quality standards protecting the Wisconsin River? What is the waste load the proposed mine will have on the river?

A: Based on dissolved oxygen monitoring on the Wisconsin River at a number of locations, the 5 mg/L dissolved oxygen standard for the river is not always met between Rhinelander and Tomahawk. This indicates the river cannot always handle the BOD₅ load which enters the river from both point source wastewater dischargers (those municipalities and industries with permits to discharge) and storm water runoff. Data appears to indicate low dissolved oxygen occurs after large storms when there's substantial runoff entering the river. The water quality standard for the Wisconsin River is designed to protect its uses, including fishing. The problem is that the water quality is sometimes impaired, so the river may not be protected adequately to maintain the dissolved oxygen standard. Because of these conditions, the Department announced it would begin the long process of remodeling the dissolved oxygen in the river and, if necessary, re-allocating the available BOD load to the various dischargers.

There are currently 5 major permitted discharges into Segment A of the Wisconsin River. Together, these industries and municipalities are permitted in their discharges several thousand pounds of BOD₅ demand per day, varying with the river flow and temperature. The proposed Crandon discharge originally would have contributed a maximum of 144 pounds of BOD₅ demand per day (based on a BOD₅ of 10 mg/L and effluent flow of 1.729 million gallons.) However, because the Wisconsin River receives too much BOD₅ demand already, we informed CMC that the Department could not permit detectable amounts of BOD₅ demand in its discharge. As a result, we expect CMC to develop a proposal for Department review that would limit its discharge of BOD₅ to an undetectable level.

34.

Q: Can this permit be denied due to flood water moving waste to the river?

A: Runoff containing wastes with a BOD₅ demand is a factor in the BOD₅ wasteload allocation. This runoff, along with the point source discharges from municipalities and industries, currently prohibits DNR from permitting any further BOD containing wastewater discharges into the Wisconsin River between Rhinelander and Tomahawk because it receives too much oxygen demanding wastes. Consequently, a proposed discharge into the Wisconsin River for the Crandon Mine would be limited to *no detectable* BOD₅ during the wasteload allocation period of May 1 through October 31.

Storm water runoff into area streams would also be controlled at the mine site. Several storm water retention ponds would collect runoff to settle out suspended solids prior to discharging to natural drainage ways. Runoff from the central mill area, which could become contaminated from the mining activities, would be collected and treated in the wastewater treatment system prior to discharging.

35.

Q: How is NR 212 monitored at the construction site (hourly or daily)?

A: This response will assume that the NR 212 reference refers to BOD₅, and that the construction site refers to the mine site. The wastewater treatment system effluent will probably be monitored weekly for BOD₅ demand. Some metal indicator parameters would be monitored daily to check performance of the treatment system and to determine compliance with effluent limits prior to discharging. BOD₅ demand wouldn't be a good parameter to determine whether a discharge may occur because the test is conducted over a period of 5 days. Hourly sampling would be impractical. When a BOD₅ sample is collected it would consist of a 24 hour composite to be representative of a daily discharge average.

36.

Q: At times when the river is running fast wouldn't that carry minerals down the river past Wausau?

A: River sediment could be re-suspended into suspended solids during high flows and be carried downstream. The proposed Crandon Mine effluent into the Wisconsin River would be extremely low in suspended solids, probably 10 mg/L or less. The treatment process proposed for the mine would include a clarifier and sand filter to remove suspended solids, which may contain minerals, to a level insignificant to the Wisconsin River. Dissolved metals, which could become attached to sediment in the river, may also be present in the discharge. However, permit effluent limits for metals are designed to protect the environment from a harmful accumulation of metals from a discharge.

Wisconsin River (Segment A) BOD Reallocation

37.

Q: If zero new industry is down river now - how will this new discharge affect them? How would future development be affected?

A: Existing and new industry down river of Segment A would not be affected by any BOD wasteload allocation in Segment A. The oxygen concentration of the river is fully recovered when the water leaves Segment A (see Response #39), and therefore the wasteload allocation would not impact downstream areas.

The reallocation could affect new industry within Segment A if they are of the type that discharge organic waste. The river is fully allocated so no new organic waste discharges are allowed under current rules. The new allocation could distribute all of the allotment to existing dischargers which could limit new industry. The new allocation could also designate some of the total allowable waste load as reserve capacity which would be available to accommodate new industry. The DNR will be looking for guidance from the public as to how the allocation will be distributed for the next allocation process.

38.

Q: What about the monitoring or predicting impacts along lower reaches of the Wisconsin River, say below Wausau? Are you stopping your review at Grandfather Dam?

A: This round of model recalibration will cover the segment from Rhinelander to Grandfather Dam. No additional work in the Wausau area is planned as part of this Segment A update.

39.

Q: If Section B & C do not allow for any additional WLA, how do you stop waste going past the Grandfather Dam?

A: The Wasteload Allocation process focuses on biochemical oxygen demand, or BOD. BOD is one component of water quality. BOD is caused when organic and inorganic matter decays in the river. The process of decay uses up oxygen in the water body. BOD decreases exponentially, with a "half life" in the river which is typically around 2 to 3 days. For example, 100 pounds of BOD will decay to 50 pounds in 3 days, 25 pounds in 6 days, 12.5 pounds in 9 days, etc. While this never reaches absolute zero, it quickly gets to a small number.

Now imagine a discharger putting 100 pounds of BOD into the river at Rhinelander under low flow conditions. Travel time of the river water to Wausau may be 2 weeks or more. The organic matter left by the time it gets to Wausau would be about 3 pounds, which is far too small to have any impact.

40.

Q: If transferable discharge allocation is sold to another company, does DNR regulate the different quantity and quality of discharge from the new company?

A: Yes, if a portion of the discharge allocation is transferred to another company the DNR would regulate the quantity and quality of the new discharge in the same manner as all dischargers. They would be required to obtain a discharge permit and discharge within the limits set to maintain water quality within State standards. It should be realized that all discharges do not impact the river in the same way, so that would have to be taken into account before any approval is given to transfer allotments.

41.

Q: When selling allocations, who gets the money? How much? If no one wants to sell what then?

A: Allocations cannot be "sold" under current regulations. The current permit holder can surrender an allocation to the Department (with the intention to reallocate to another discharger), but the Natural Resources Board decides whether to reallocate the pounds and if so, under what restrictions. There may be financial exchange between the dischargers, but they do not bind the Natural Resources Board on the reallocation process.

Risk Management

42.

Q: How do you heighten the variables associated with "risk" or less tangible concerns?

A: The Department will be compiling a thorough risk analysis, to include such factors as increased roadway and railway transportation of chemicals to the mine site. Other intangible concerns, including aesthetics and noise, will be evaluated in the EIS. These concerns, however, are not regulated by state mining or environmental law. The Legislature has delegated many of these decisions to local governments. See also Response #43.

43.

Q: Why are emergency clean up measures planned or needed for such a "safe" mine? Followup: Do seat belts and air bags (emergency clean-up measures) save all lives, all of the time?

A: An emergency response plan adds an extra measure of protection against environmental harm due to unforeseen circumstances. By providing a detailed list of steps to take in emergencies, such plans can greatly reduce the severity and extent of damage due to accidents that can occur in everyday operation of industrial facilities. Such plans are a standard feature of all responsible industries in the U.S.

It is more accurate to characterize seat belts and air bags (as well as brakes, door reinforcement beams and guard rails) as protective devices - tow trucks, ambulances and hospital emergency rooms are the parallels to emergency clean-up measures. Comparable protective devices would include the TMA liner and cap, the sewage treatment plant, and reinforcing members and pressure relief valves on railroad tank cars. No one would claim that these protective devices work as designed all the time. That is why it is necessary to have emergency response plans in place.

44.

Q: The mine site is located among lakes and streams. If there were an accident, how could you stop the contaminants from moving through the surface water system? How can the DNR protect lakes and streams in the area from spills? What would some methods be?

A: If this project is permitted, it would have an extensive environmental monitoring program that would require detailed groundwater and surface water monitoring on and around the facility. In addition to groundwater and surface water monitoring, the mine and tailings facility would be monitored closely to make sure they are performing as designed and predicted. This monitoring should detect discharges of contaminants to groundwater or surface water quickly. Should a significant release of contaminants occur that is not quickly detected, the monitoring program would find it prior to movement outside the watershed. At that point, a clean-up program would be initiated. Depending on the type of release, clean up could involve repair of the tailings facility, installation of cutoff walls, pumping of groundwater for treatment or to control movement, installation of reactive walls, or many other techniques.

Similar control mechanisms could be used for accidental reagent spills. A detailed emergency response contingency plan and risk assessment will be developed by CMC and

submitted to the DNR for review as part of the Mine Permit Application.

45.

Q: Will the Crandon Mine be shut down if any of the environmental protection standards are exceeded?

A: In the event that an environmental protection standard, and resultant permit limit, is violated, the degree and frequency of the violation would be evaluated to determine what DNR action is appropriate. Ranges of action include a notice of violation, an enforcement conference to discuss what action is necessary to prevent future violations, the issuance of an order with a compliance schedule to achieve compliance, and referral to the Attorney General's Office for prosecution if violations persist. In addition, the Mining Law (Ch. 293, Wis. Stat.) gives the DNR the ability to issue a stop order, requiring an immediate cessation of mining, if there is an immediate and substantial threat to public health, safety, or the environment. In addition, failure to comply with an order of the Department can result in permit revocation and civil penalties.

Appendix A: Draft Timeline**, DNR review process

- | | | |
|-------------|--|--|
| I. | Release of Draft EIS | EARLY 1998 |
| | <ul style="list-style-type: none">1) Within 10 days of the release of the DEIS, legal notice for the DEIS hearing will be given.2) Within 30-60 days of the release of the DEIS, the hearing on the DEIS will be held. | |
| | | |
| II. | Release of Final EIS | 3-4 MONTHS AFTER DEIS HEARING |
| | | |
| III. | Master Hearing | BEGINS 4-6 MONTHS AFTER RELEASE OF FINAL EIS - PROBABLY FEB. 1999 |
| | <ul style="list-style-type: none">1) Testimony<ul style="list-style-type: none">*Technical Testimony*General Public Testimony*Transcript Production2) Briefing Schedule<ul style="list-style-type: none">*Applicant & Sponsor Briefs*Response Briefs by Applicant and Sponsors | <p>2 months duration</p> <p>4-5 months duration</p> |
| IV. | Written Decision | 3 MONTHS AFTER RECORD CLOSES - PROBABLY LATE 1999 |

****** This timeline is not intended to be precise. The schedule will be driven by science and technical requirements, not by a pre-conceived timeline. The DEIS will not be issued until the DNR has sufficient information to do so.

Note: The Crandon project needs approval from the U.S. Army Corps of Engineers; in addition, the proposed mine must comply with all local zoning and land use requirements before the DNR could issue its permits and approvals.

Appendix C: Expected Quality of the Treated Wastewater (Preliminary Figures)

<u>PARAMETER</u>	<u>EXPECTED WASTEWATER CONCENTRATIONS</u>
Total Solids	1,430 mg/L
COD*	17 mg/L
Hardness	830 mg/L
Alkalinity	14 mg/L
pH	7.14 su
Conductivity	1600 µmhos/cm
Ammonia N	804 µg/L
Nitrate N	217 µg/L
Tot. Kjeldahl N	1000 µg/L
Chloride	41,000 µg/L
Fluoride	210 µg/L
Phosphorus	26 µg/L
Boron	46 µg/L
Cyanide	<10 µg/L
Aluminum	61.7 µg/L
Antimony	<2 µg/L
Arsenic	0.3 µg/L
Barium	150 µg/L
Beryllium	0.005 µg/L
Cadmium	0.03 µg/L
Calcium	190,000 µg/L
Chromium	0.38 µg/L
Copper	5.7 µg/L
Iron	50 µg/L
Lead	0.016 µg/L
Magnesium	87,000 µg/L
Manganese	4.7 µg/L
Mercury	.04 µg/L**
Molybdenum	4 µg/L
Nickel	4.9 µg/L
Potassium	14,000 µg/L
Selenium	110 µg/L
Silver	0.024 µg/L
Sodium	51,000 µg/L
Sulfate	900,000 µg/L
Thallium	<1 µg/L
Zinc	2.9 µg/L

* COD stands for chemical oxygen demand. COD is always a larger number than BOD (biochemical oxygen demand). No results were obtained from the BOD analysis due to problems in running the test.

** The precise concentration for mercury is unknown, because the level of detection used was

0.03 µg/L and level of quantitation was 0.08 µg/L. The analysis shows mercury is present, but because it's below the level of quantitation the actual concentration is unknown. An ultra low level test, with a level of detection <0.00005 µg/L, done by the Flambeau Mine on their wastewater effluent, had results of 0.00033 µg/L and 0.00035 µg/L. The CMC proposed wastewater treatment system would use the same processes as the Flambeau Mine.